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(54) Title: IMPROVEMENTS IN AND RELATING TO HONEY BASED PRODUCTS

(57) Abstract: This invention is directed to methods of manufacture, apparatus for manufacturing and final products produced in accordance with a honey based product. The product is produced by combining a quantity of thickening agent with a solvent to produce a gelling agent, mixing the gelling agent with honey, and reducing the solvent content of the honey-gelling agent mixture to achieve a honey based product including more than 90 % honey by weight of the combined honey-gelling agent mixture. The honey based product has application as confectionery products, wound dressings and internal and external therapeutic uses. The honey-based products may be produced using honey in any form, whether liquid, crystallised, spray-dried, freeze-dried and using both "active" and "non-active" honey. The manufacturing process is able to retain both the peroxide and non-peroxide activity of the "active" honey in the final honey-based product.

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IMPROVEMENTS IN AND RELATING TO HONEY BASED PRODUCTS

TECHNICAL FIELD

This invention relates to improvements in and relating to honey based products.

In particular, this invention is directed to methods of manufacture, apparatus for
5 manufacturing and final products produced in accordance with this invention. It
is envisaged the invention will be directed primarily to honey-based confectionery
products such as edible chewy bars, chewing gums and the like, jelly-type and
jam-like products. However, the products may also be used in other applications
including wound dressings and so forth.

10 The honey-based products of the present invention have a very high honey content
equating to approximately 95% by weight of the product. This is a substantially
higher honey content than previously attainable in honey confectionery and other
comestible products.

The honey-based products may be produced using honey in any form, whether
15 liquid, crystallised, spray-dried, freeze-dried and so forth. In addition, both
“active” and “non-active” honey may be used in the production of the products.
The preferred manufacturing process is able to retain both the peroxide and non-
peroxide activity of the “active” honey in the final honey-based product.

However, it should be appreciated that aspects of the invention may have
20 applications outside this field.

BACKGROUND ART

The methods of manufacture of honey-based products whether as
edible/confectionery products or otherwise have been previously problematic by

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virtue of the characteristics of honey *per se*.

Traditional manufacturing processes require treatment of confectionery ingredients at high heats and for long periods. Such processes have deleterious affect on the beneficial properties of honey – specifically the peroxide activity of

5 “active” honeys.

In New Zealand certain honey has been found to have unique and significant non-peroxide activity as well as peroxide activity and have therefore been found to be advantageous or even therapeutic in a number of applications, such as externally as wound dressings, or as treatments for colds, influenza and other ailments when

10 consumed.

Typically, confectionery items have had varying amounts by weight of honey, as an ingredient. However, the very properties of honey have limited its usefulness in producing honey-based products with substantially high levels of honey in them. Such characteristics include the hygroscopic nature of honey that has

15 negatively impacted on its shelf stability for any length of time. Accordingly, the honey content of traditional confectionery products has been limited to less than 10% of the total weight of the confectionery item rather than as a major ingredient of such products.

It would therefore be an advantage to produce a honey-based product that:

- 20 a) Used honey as the predominant ingredient; and
- b) Was able to use honey in any form (crystallised, spray-dried, freeze-dried, creamed or liquid honey); and
- c) Could include honey having high non-peroxide activity and/or peroxide activity, thereby enabling the honey-based product to be used not only as a

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confectionery/comestible item but also being able to be used in a therapeutic application; and

- 5 d) Was able to be produced by a manufacturing process that did not reduce or destroy preferred non-peroxide (antibacterial) activities of "active" honey; and
- e) Was able to be produced using a simple manufacturing process; and
- f) Was shelf stable; and
- g) Where the honey-based product was in a confectionery form, was palatable, and
- 10 h) Was able to be shaped into any size and form, and/or in a less "dried" form could be available as a product having a jelly or jam-type consistency; and
- i) Where the honey-based product was prepared as an edible confectionery item, it could be flavoured with any preferred flavour and coated as desired in accordance with consumer preferences; and
- 15 j) Could be used as a stand alone confectionery item, in conjunction with other foods items, or even be used as or with a wound dressing, and so forth.

It is an object of the present invention to address the foregoing problems or at least to provide the public with a useful choice.

- 20 Further aspects and advantages of the present invention will become apparent from the ensuing description which is given by way of example only.

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DISCLOSURE OF INVENTION

According to one aspect of the present invention there is provided a method of manufacturing a honey based product, said method including the steps of:

- a) combining a quantity of a preferred thickening agent with a solvent, and
- 5 b) mixing the combined thickening agent-solvent with a quantity of honey, and
- c) transferring the honey-thickening agent mixture into receptacles, and
- d) processing said honey-thickening agent mixture to achieve the preferred consistency, and
- 10 the method characterised by the product including more than 90% honey by weight of the combined honey-gelling agent mixture.

For the purpose of this specification, the term thickening agent applies to any product capable of being used to thicken the consistency/viscosity of, or being used as a setting agent for, a honey product produced. Accordingly the thickening
15 agent may be any gum, starch, gelatinous polysaccharides, protein, and so forth capable of being used in a food product or in a dressing/application for use on wounds. The quantity and type of the thickening agent used being dictated by the required form of the product.

Also for the purpose of this specification the term solvent shall mean any fluid
20 substantially comprised of water, but may also include a water-co-solvent mix, or any other solvent, as required to enable the thickening agent used to be dissolved in or mixed with the solvent, as required for the purpose of this invention.

According to another aspect of the present invention there is provided a method of

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manufacturing a honey-based product substantially as described above including either or both additional step(s) as required to achieve the preferred final product of:

- a) optionally shaping the honey product as required; and
- 5 b) preparing the honey product for either or both wrapping and further processing.

According to another aspect of the present invention there is provided a method of manufacturing a honey-based product substantially as described above wherein the honey used includes any one of or a combination of spray-dried honey, freeze
10 dried honey, liquid honey, crystallised honey and creamed honey.

According to another aspect of the present invention there is provided a method of manufacturing a honey-based product substantially as described above wherein the thickening agent when combined with water as the solvent optionally includes the step of heating the water up to or greater than 80°C prior to the addition of the
15 thickening agent.

As can be appreciated, the temperature of the solvent prior to mixing the solvent with the thickening agent will be dependent on the properties of the solvent and/or the thickening agent. For example, mixing starch based thickening agents with cold water is preferable to using hot water to avoid the thickening agent-water
20 mixture being lumpy, and so forth. The temperature of the thickening agent-solvent mixture may then be raised as required for the next stage of the manufacturing process.

According to another aspect of the present invention there is provided a method of manufacturing a honey-based product substantially as described above wherein
25 the thickening agent is mixed with the water in preferred proportions of

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water:honey weight used.

According to another aspect of the present invention there is provided a method of manufacturing a honey-based product substantially as described above including the optional steps of adding additional ingredients, including any of flavourings, colourings, gums (chewing), nuts, and so forth to the honey-thickening agent mixture prior to drying to form the honey product as required.

According to another aspect of the present invention there is provided a method of manufacturing a honey-based product substantially as described above wherein processing of the honey-thickening agent mixture includes reduction of the water content of the honey-thickening agent mixture to achieve any one of a chewable consistency, leather-like consistency, a mouldable, jelly-type consistency or a spreadable, jam-type consistency of the final honey based product.

According to another aspect of the present invention there is provided a method of manufacturing a honey-based product substantially as described above including an optional step of applying a flavoured and/or coloured coating to the shaped honey product.

According to another aspect of the present invention there is provided a honey-based product produced according to the method substantially as described above capable of use as a confectionery or therapeutic product.

The honey-based product may be made using either or both an "active" honey (being a honey having higher than 10% non-peroxide activity), and a non-active honey.

In New Zealand, Manuka honeys are regarded as having "active" properties (unique non-peroxide activity, antibacterial activity as well as peroxide activity) found to be advantageous or even therapeutic in treating a number of ailments,

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both internally and externally, as well as fighting colds and influenza.

Traditional honey processing often relies on high processing temperatures, sustained for long periods. However, in manufacturing the honey-based product of the present invention, it is preferable that processing temperatures are lower or at
5 high temperatures for very short time periods. Optimum temperatures of stages of the preferred manufacturing process are discussed in more detail later in the description.

To produce the honey-based product of the present invention, preferably 90% or more of the product is honey. Liquid, freeze dried, spray dried, creamed or
10 crystallised honey may be used alone or in any combination.

Spray dried honey (or even the freeze dried form) is a preferred ingredient of the product where its preferred use is to be of a therapeutic nature, as any high, non-peroxide activity is maintained along with other preferred honey qualities such as flavour, texture and so forth.

15 To obtain the preferred honey-based product, the honey is mixed with a preferred thickening agent. Preferred thickening agent(s) include gelling agents such as Xanthan gum, and pectin. However, a range of other suitable gelling/thickening agents may be used with this invention. The quantity of agent used will be dependent on the actual agent itself. For example, a greater proportion of
20 Xanthum gum would be used compared with the amount if the gelling agent were pectin. Preferably the quantity of Xanthum gum used would equate to 4.17% of the overall mixture, whilst only 2% of pectin may be used.

Further, there are several commercially available gelling/thickening powder mixes that include Xanthum gum and/or pectin in varying proportions and in
25 combination with other ingredients. Use of such gelling/thickening agents have

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not typically been involved in the production of high-concentration honey products such as those of the present invention.

In preferred embodiments the Xanthum gum, pectin, or any other suitable gelling/thickening agent is mixed with water prior to the addition of the honey.

5 Preferably, hot water of at least 80°C is used where the agent is pectin or Xanthum gum. A temperature of 80°C is the preferred optimum temperature with these gelling agents. The temperature of the solvent at mixing, or even the temperature to which a thickening agent –solvent mixture is raised to, may however, range from 40°C-90°C. Although, depending on the thickening agent
10 used, and particularly bearing in mind the addition of the honey to be homogeneously mixed with the thickening agent, lower or higher temperatures may not achieve the desired mixing of the thickening agent with the solvent, or the mixing of the honey and thickening agent.

Preferably the ratio of water to gelling agent is dictated by the quantity of honey
15 used. For example, the amount of water used is preferably 2.5 times the quantity of honey to be mixed with the gelling agent-water mixture.

The preferred quantity of honey is preferably then added to the agent-water mixture. A preferred ratio is 4.17% gelling agent : 95.83% honey by weight, where the gelling agent is Xanthum gum. However, where pectin is the gelling
20 agent the percentage by weight of the gelling agent may be lower – for example 2%. The amount of thickening agent being dependent on the thickening properties of the particular agent used.

The gelling characteristics of the honey (particularly of Manuka honey) in combination with the added gelling agent(s) further contributes to overcoming
25 honey's hygroscopic characteristic, thereby producing a product having a greater shelf stability than has been achieved previously.

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Preferably the honey and agent mixture are combined to form a homogenous gel having the consistency of custard, while the gelling agent mixture is still warm.

Preferably the mixing of the honey with the agent powder is undertaken at a temperature preferably between 50°C and 60°C for about five to 10 minutes until
5 all the ingredients are mixed together. Such a process may take less or more time, with slight variations in the temperature of the mixture. However, it is preferable that mixing time be kept to a reasonable minimum.

The temperature range is preferred to ensure optimum mixing. If the honey mixture is too cool the mixture becomes less workable, whilst at higher
10 temperatures the properties of any "active" honeys may be affected.

Optionally, at this mixing stage any of preferred flavourings, colourings or other ingredients (such as chocolate chips, nuts and so forth) may be added. A range of standard food colourings and flavouring products are available in the prior art and may be used with this invention. Where the final product will be a honey based
15 chewing gum, the gum ingredients are preferably added at this stage. For the jam-like consistency product other ingredients may be added to the mixture prior to transferring it to the receptacles. The nature and quantity of the additional ingredients will vary depending on the final product required.

Once the honey and the agent mixture has been combined (including any
20 additional ingredients) the honey product is then preferably weighed and a preferred quantity is transferred to a receptacle for the next stage of the process that includes reduction of the water content of the mixture.

This reduction in the water content of the honey-agent mixture may be achieved by evaporation through drying. For example, in one embodiment, where honey
25 leather is to be produced, the honey-agent mixture is preferably transferred to

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drying trays for the next stage of the process. The amount of honey-agent mixture transferred to the drying trays will vary depending on the dimensions of the trays. There is therefore no limitation on the size or shape of the final product.

Where the product is to be in the form of a chewing gum, jelly-type consistency,
5 or a jam-like consistency, the honey-agent mixture may be transferred to varyingly shaped receptacles appropriate to the preferred shape and sized portion required of the final product.

For a honey leather product, preferably the honey-agent mixture is spread evenly over the drying trays, (the drying trays being also preferably lined with plastic
10 material or other suitable material to enable the dried honey leather product to be easily removed from the trays). Similar liners may be used in the production other shaped versions of the product, such as the honey based chewing gum product.

The receptacles – whether trays or otherwise- are then placed into a drying and/or desiccating environment, so that the water content of the product is reduced to
15 produce the required consistency of the final honey-based product. In some embodiments, a conventional drying oven may be used. In other embodiments freeze-drying may be employed, as may be any other suitable desiccating systems.

Where conventional drying ovens are used to dry the product in drying trays (for example), the mixture is preferably dried at 60°C for approximately 12 hours, or
20 until the dried weight of the honey product reaches that required. The weight will of course vary with the size of the trays used, but on average the weight of the mixture will be reduced by approximately 20% to 30%.

In this form a honey leather product may be produced. The honey leather is a substantially thin layer of concentrated and substantially desiccated honey-agent
25 mixture (with or without flavourings or additional ingredients). It is preferably a

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flexible and chewy product.

After drying the dried mix, which we have referred to as honey leather, is then removed from the plastic tray liner and shaped.

The shapes may vary as required, but for example, the honey leather may be cut
5 into small squares, elongate bars, or any preferred configuration. Alternately, in some embodiments the honey leather may be rolled or folded into a preferred shape.

Where the product is to be included in a form of chewing gum, or has the consistency of jelly or jam, the shape of the container in which the honey is placed
10 during the "drying" process, and the length of the drying process, will dictate the final product.

Where the product is to be a chewing gum the container may be a tray incorporating individually shaped indentations, or similar into which the honey product is delivered. The substantially dried product may then be used as a honey
15 centre in individual pieces of chewing gum, or alternately, the honey product may be used in the production of the chewing gum as a replacement ingredient for the sugars and/or corn starch otherwise used. In other embodiments, individual pieces of chewing gum may be coated with a layer of the honey product in a dried honey leather form.

20 Where the product is to be a jelly-type or jam-type consistency, and the product is to be used as a confectionery/ dessert topping item, the container may be a sterile squeeze bottle, or a container able to be subsequently pressurised, and able to dispense single applications of a flowable honey-based product as required. Alternatively individual jelly moulds or jam containers may be used and the
25 product prepared for sale in such moulds.

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Where the product is to be used topically as a wound application, the container may be a sterile syringe, the syringe having a seal capable of being broken prior to application of the honey product. As can be appreciated the receptacle may vary depending on the final product required and its intended application.

- 5 The more liquid forms of the honey mixture (whether including active honey or not) may be used to produce soft-centred confectioneries, such as chocolates with a flowable honey centre. Flavourings may also be included, such as liqueur flavourings and so forth that may be directly added to the honey product. Alternately, melted chocolate may also be mixed into the honey in another
- 10 embodiment of the confectionery, or the shapes may be coated with chocolate or any other preferred coating.

- Where the honey leather form has been cut or shaped into the appropriate shapes required, or the chewing gum shapes have been formed, the configured honey leather/gum products are preferably dropped into, and substantially coated with, a
- 15 powdered starch. Preferably potato starch is used, although any other suitable starch such as corn-starch and/or other available dried powder coatings may be employed. The powder coating minimises the potential for the product to become sticky during handling.

- After the shaped honey leather has been coated with the preferred starch, the
- 20 coated, shaped product is then preferably packed into individual waterproof wrapping, or as previously mentioned, coated with any other preferred coating. Where the product is stored, and before further processing of product such as pattern stamping on the honey leather or addition of other coatings, any extra potato starch/powder coating surrounding the shaped honey leather is preferably
- 25 removed by a sieving action.

For storage purposes between 5-10 individually wrapped rolled or folded bars of

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the honey leather may be stored in an air-tight container until further use. The honey jelly or jam-like product is preferably sealed in individual air-tight containers.

Preferably, the storage conditions should be maintained at temperatures under 5 18°C, with a relative humidity of under 75%. At this stage, the humidity is controlled primarily to ensure degradation of the starch/powder coating is minimised. Varying storage requirements will be dictated by the final product and its use.

10 The main advantages of the present honey-based confectionery product over existing products are that:

- a) it has a very high honey content; and
- b) the confectionery product can take any preferred shape depending on its consistency; and
- c) any suitable flavouring, colouring and/or coating can be used. For 15 example, yoghurt, carob, chocolate, crystallised/sugar products or gelatine coatings can be used; and any fruit flavours, liqueurs, chocolate, nut or carob flavourings; and so forth may be used; and
- d) where "active" honey is used, the honey-based product retains the therapeutic non-peroxide activity levels for use either internally by eating 20 the honey leather, chewing gum, jelly or jam, or externally by applying the product to wounds in either or both a jelly form or a leather form, warmed up as heat pack, and so forth; and
- e) the product can be used as a snack food, as a stand alone confectionery item such as bars, toffees and so forth, and as a health/dietary supplement;

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and

- f) the product can be a comestible product available on its own or available in conjunction with other food stuffs such as breakfast cereals and so forth; and
- 5 g) the honey-based confectionery product can be available as either a solid form or as a more flowable product having a greatly improved, stable, shelf life; and
- h) the confectionery product is designed to be palatable to people within all age groups; and
- 10 i) the malleable nature of the mixture during processing also enables other ingredients to be added, such as nuts, raisins, coconut and so forth to provide a wide variety of confectionery/comestible items.

BEST MODES FOR CARRYING OUT THE INVENTION

- Examples given below as to the method of manufacturing the honey-based
- 15 products of the present invention are given by way of example only, and it should be appreciated that variations to the ingredients, methods of mixing and shaping of the product and the finishing processes may be made.

EXAMPLE 1

1. Preferred Ingredients

- 20 • Active Manuka honey – more than 90% by weight. For example, where the thickening agent is Xanthum gum or pectin the honey weight will be approximately 95.83% or 98% by weight, respectively.

Although any honey may be used and in any form (crystallised, creamed, liquid or

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dried).

- Gelling agent (where Xanthan gum - 4.17% by weight and a corresponding weight of honey; where pectin – 2% by weight)
- Solvent, such as water – to mix with the thickening agent. Typically the amount of water will equate to approximately 2.5 times that of the weight of honey to be used.
- Dusting powder to coat the finished product – where the product is in the form of honey leather, chewing gum, single confectionery items and so forth.
- Additional ingredients as required for the particular product.

10 2. Variations

- Any combination of creamed, crystallised, dried or liquid honey may make up the percentage by weight of honey required to complement the weight amount of the gelling agents depending on the desired final product texture, flowability and so forth
- either both “active” or “non-active” honey may be used for honey ingredients
- Freeze dried honey may be used instead of spray-dried honey.
- Corn starch or any other suitable dusting powder may be used for dusting/coating the product for its storage

3. Optional Extras

- Flavourings – any fruit flavourings, yoghurt powder/alcoholic liqueurs/chocolate/carob and so forth.
- Food colourings – any suitable colouring may be used

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- Coatings – chocolate/carob/yoghurt/sugar or crystallised coatings, coconut/nuts, chocolate hail, hundred and thousands/sprinkles and so forth
- Additional ingredients – herbal powders, dietary supplement powders, vitamins, nuts, fruit chips, chocolate/carob chips, chewing gums to surround
5 or be coated with the honey product, or use of the honey product to replace the sugars/starch ingredients typically used in the production of chewing gums, and so forth

EXAMPLE 2**Preferred Equipment Required**

- 10 • Any suitably sized mixing tank (preferably 1 ton capacity as any greater quantity of ingredients impacts on optimal mixing)
- Mixing/homogenising utensils
- Drying oven (temperature and humidity controlled)
- Drying trays or other suitable receptacles
- 15 • Plastic liners for drying trays
- Machinery for depositing quantities of honey mix into drying trays/receptacles
- Machinery for depositing quantities of honey mix into drying trays for individual confectionery items
- Cutting device for cutting dried honey leather
- 20 • Wrapping machine for wrapping individually shaped confectionery items.

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EXAMPLE 3**A Preferred Manufacturing Process**

1. The quantity of Xanthum gum (or pectin) gelling agent(s) is mixed with hot water (preferably over 80°C, with the amount of water used equating to approximately 2.5 times the quantity of honey to be used) until all is thoroughly mixed.
5
2. The total quantity of honey (whether creamed, crystallised, freeze-dried, spray dried or liquid) is then added to the agent-water mixture and mixed together to form a homogenous gel mix (custard looking mix) while the mixture is kept warm.
10
- The mixing is undertaken preferably at a temperature between 50°C-60°C
- The mixing time is preferably 5-10 minutes.
3. Flavourings and/or colourings and/or additional ingredients such as nuts, chocolate chips and so forth, if required may be added at this stage.
- 15 4. A 2kg quantity of the combined mixture is weighed and put onto drying trays (which have plastic liners).
5. The mixture is spread evenly over the trays.
6. The mixture on the trays is dried in a drying oven at 60°C for 12 hours, until the finished dry weight of the honey leather reaches under 588g per tray (this stage depends on the size of the tray and quantity of honey mixture used).
20
7. After drying, the dried mix, called honey leather, is removed from plastic liner and rolled, folded into or cut into the preferred shape(s).

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8. The shaped product is then thoroughly coated with potato starch (or other suitable dusting powder) if required and packed into individual waterproof wrapping, or coated with various flavoured and/or coloured coating.
9. Preferably 5-10 individually wrapped products are stored in boxes for better storage. Storage should be maintained at a temperature preferably below 18°C with less than 75% relative humidity.

EXAMPLE 4**An Alternative Preferred Manufacturing Process**

1. Steps 1 to 4 are substantially the same as those for example three above, although variations may include use of different gelling agents and different proportions of the various forms of honey.
2. A preferred quantity of the combined mixture is deposited into appropriately shaped and sized containers, in which the finished honey product may remain.
3. The mixture is dried (in a drying oven at 60°C, freeze dried or otherwise desiccated) for fewer hours, until the honey mixture is of the required consistency.
4. After drying, the mixture may be the consistency of a jelly or jam-like product, depending on the drying time and the additional ingredients added to the mixture prior to the drying stage.
5. Storage should be maintained at a temperature preferably below 18°C with less than 75% relative humidity to minimise the effects of the hygroscopic nature of the honey.

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Packaging

Any suitable packaging capable of minimising moisture entry may be used.

Aspects of the present invention have been described by way of example only and it should be appreciated that modifications and additions may be made thereto

5 without departing from the scope thereof as defined in the appended claims.

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THE CLAIMS DEFINING THE INVENTION ARE:

1. A method of manufacturing a honey based product, said method including the steps of:
 - a) combining a quantity of thickening agent with a solvent to produce a gelling agent, and
 - b) mixing the gelling agent with honey, and
 - c) transferring the honey-gelling agent mixture into receptacles, and
 - d) effecting reduction of the solvent content of said honey-gelling agent mixture to achieve a substantially thickened consistency, andthe method characterised by the production of the honey based product including more than 90% honey by weight of the combined honey-gelling agent mixture.
2. A method of manufacturing a honey based product as claimed in Claim 1 wherein the method also optionally includes either or both additional step(s) as required to achieve the preferred final product of:
 - a) shaping the honey product; and
 - b) preparing the honey product for any one or more of storage, wrapping and further processing.
3. A method of manufacturing a honey based product as claimed in either or both Claim 1 and Claim 2 wherein the honey based product produced is used as any one of a food product, an internal therapeutic application, an external therapeutic application.

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4. A method of manufacturing a honey based product as claimed in Claim 1 wherein the thickening agent includes at least one of a gum, starch, gelatinous polysaccharide, protein.
5. A method of manufacturing a honey based product as claimed in Claim 4 wherein the thickening agent includes Xanthum gum, pectin.
6. A method of manufacturing a honey based product as claimed in Claim 1 wherein the solvent includes water, a water-co-solvent mix, required to enable the thickening agent used to be dissolved in or mixed with the solvent.
7. A method of manufacturing a honey based product as claimed in claim 6 wherein the solvent is optionally heated prior to mixing the solvent with the thickening agent as dependent on the properties of the solvent and/or the thickening agent.
8. A method of manufacturing a honey based product as claimed in Claim 7 wherein the quantity of solvent used with the thickening agent is determined by the weight of honey used for the honey based product.
9. A method of manufacturing a honey based product as claimed in Claim 8 wherein the quantity of solvent to thickening agent is 2.5 times the quantity of honey to be mixed with the gelling agent formed and is dependent on the properties of the thickening agent used.
10. A method of manufacturing a honey based product as claimed in Claim 9 wherein the quantity of honey added to the gelling agent mixture is in a ratio of 4.17% gelling agent:95.83% honey by weight, where the thickening agent is Xanthum gum.

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11. A method of manufacturing a honey based product as claimed in Claim 9 wherein the quantity of honey added to the gelling agent mixture is in a ratio of 2% gelling agent:95.83% honey by weight, where the thickening agent is pectin.
12. A method of manufacturing a honey based product as claimed in Claim 1 wherein the step of mixing the honey with the gelling agent optionally includes an increase in temperature or maintenance of the temperature of the warmed gelling agent to effect a homogenous mixture.
13. A method of manufacturing a honey based product as claimed in claim 12 wherein the gelling characteristics of the honey in combination with the added gelling agent(s) contribute to overcoming the hygroscopic characteristic of the honey, thereby producing a product having improved shelf stability.
14. A method of manufacturing a honey based product as claimed in Claim 13 wherein the honey used is either or both an "active" honey, including a honey having higher than 10% non-peroxide activity, and a non-active honey.
15. A method of manufacturing a honey based product as claimed in Claim 14 wherein the honey used is in the form of any one of or a combination of spray-dried honey, freeze dried honey, liquid honey, crystallised honey and creamed honey.
16. A method of manufacturing a honey based product as claimed in Claims 14 and 15 wherein active honey in either or both spray dried and freeze dried form is used for therapeutic applications to maintain substantially high, non-peroxide properties in the honey based product.

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17. A method of manufacturing a honey based product as claimed in Claim 14 wherein the honey used is also selected on the basis of at least one of flavour, texture, colour.
18. A method of manufacturing a honey based product as claimed in Claim 1 wherein reduction of the solvent content of the honey-gelling agent mixture is effected by drying the mixture for a period to achieve a honey based product having any one of a chewable, leather-like, mouldable, jelly-type, spreadable consistency.
19. A method of manufacturing a honey based product as claimed in Claim 18 wherein the honey leather product is a substantially thin layer of concentrated and substantially desiccated honey-gelling agent mixture (with or without flavourings or additional ingredients) in a flexible form.
20. A method of manufacturing a honey based product as claimed in Claim 18 wherein drying the honey-gelling agent mixture is effected by use of any one of natural evaporation, drying oven, freeze-drying, desiccating systems as required to produce the honey based products varying in consistency from a honey leather, to a chewing gum, to a jelly-type consistency, to a jam-like consistency, to a flowable consistency.
21. A method of manufacturing a honey based product as claimed in Claims 7, 12 and 20 wherein any one of the solvent temperature, the gelling agent temperature and the drying temperature are maintained substantially low over a substantially long time period or high over a substantially short time period.
22. A method of manufacturing a honey based product as claimed in Claim 21 wherein the temperature of the solvent at mixing, or the temperature to

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which a thickening agent-solvent mixture is raised to, ranges from 40°C-90°C dependent on any one of the thickening agent used, the honey form to be used and the ability to homogeneously mix the honey with the gelling agent mixture produced.

23. A method of manufacturing a honey based product as claimed in Claim 22 wherein the optimum temperature for heating either or both the solvent and the solvent-thickening agent mixture is 80°C.
24. A method of manufacturing a honey based product as claimed in Claim 21 wherein the step of mixing the honey with the gelling agent is undertaken at a temperature between 50°C and 60°C for up to 10 minutes, to ensure optimum mixing and workability of the honey and maintenance of the properties of any "active" honeys used.
25. A method of manufacturing a honey based product as claimed in Claim 21 wherein for a honey leather product, the honey-gelling agent mixture is dried in a conventional drying oven at 60°C for up to 12 hours, or until the dried weight of the honey product is reduced on average by 20% to 30%.
26. A method of manufacturing a honey based product as claimed in Claim 1 wherein the stage of mixing the honey with the gelling agent also includes the optional addition of any of preferred flavouring, colouring, additional ingredients.
27. A method of manufacturing a honey based product as claimed in Claim 2 wherein further processing of the honey product includes an optional step of applying a coating to the honey product.
28. A method of manufacturing a honey based product as claimed in Claim 2

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wherein the product is shaped to a preferred form via the shape of the container in to which the honey-gelling mixture is placed during the solvent reduction step.

29. A method of manufacturing a honey based product as claimed in Claim 2 wherein the product is shaped to a preferred form after the solvent reduction step.
30. A method of manufacturing a honey based product as claimed in Claim 28 wherein where the final product has a jelly-type or jam-type consistency the solvent reduction step is undertaken with the honey-gelling agent mixture dispensed in to individual containers in readiness for subsequent dispensing, use or consumption of the final honey based product.
31. A method of manufacturing a honey based product as claimed in Claim 20 wherein where the product takes a more flowable form (whether including active honey or not) the product is applicable for use in soft-centred confectioneries, with or without additional flavourings.
32. A method of manufacturing a honey based product as claimed in Claim 2 wherein the honey product is further processed via application of a dried powder coating to minimise the potential for the product to become sticky during handling.
33. A method of manufacturing a honey based product as claimed in Claim 32 wherein the dried powder coating is a starch including any one of potato starch, corn starch.
34. A method of manufacturing a honey based product as claimed in Claim 33 wherein the coated product is packed for storage in substantially air-tight

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containers until further use.

35. A method of manufacturing a honey based product as claimed in Claim 34 wherein the storage conditions are optimally maintained at temperatures under 18°C, with a relative humidity of under 75% to minimise degradation of the starch/powder coating.
36. A method of storing a honey based product manufactured in accordance with a method as claimed in Claims 1 to 36 including the steps of:
 - a) applying a dried powder coating to minimise the potential for the honey based product to become sticky during handling, wherein the dried powder coating is a starch including any one of potato starch, corn starch; and
 - b) storing the honey product in air-tight containers, wherein the storage conditions are optimally maintained at temperatures under 18°C, with a relative humidity of under 75% to minimise degradation of the starch/powder coating until further use.
37. A honey based product manufactured in accordance with the method as claimed in Claims 1 to 35 wherein the honey based product has external therapeutic applications including use topically as a wound or injury dressing in the form of any one of honey leather, jelly-type consistency, optionally warmed up as a heat pack.
38. A honey-based product manufactured in accordance with the method as claimed in Claims 1 to 35 wherein the honey-based product has internal therapeutic applications including use for mouth infections and injuries, including halitosis and sore throats, promotion of dental health against

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dental caries and periodontal disease, for fighting colds and influenza, internal ulcers.

39. A honey-based product manufactured in accordance with the method as claimed in Claims 1 to 35 wherein the honey-based product has application as a comestible product including confectionery items (stand-alone or in conjunction with other food stuffs), health/dietary supplements.
40. A method of manufacturing a honey based product substantially as described herein with reference to the examples contained herein.
41. A method of storing a honey based product substantially as described herein with reference to the examples contained herein.
42. A honey based product substantially as described herein with reference to the examples contained herein.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/NZ01/00041

A. CLASSIFICATION OF SUBJECT MATTERInt. Cl. ⁷: A23L 1/08; A61K 35/64

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

See electronic databases

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

See electronic databases

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPIDS CA FSTA USPTO: A23L 1/08, honey, gelled or thickened,
gum/starch/polysaccharide/carragheen/cellulose/pectin/gelatin/galactomannan/xanthan**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	US 6,171,604 B1 (MAHMOUD A MOUSA) 9/1/01	All
X	US 5,980,875 A (MAHMOUD A MOUSA) 9/11/99	All
X	US 5,750,175 A (BRENDA C HUBBELL) 12/5/98	All

☒ Further documents are listed in the continuation of Box C ☐ See patent family annex

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search
18 May 2001

Date of mailing of the international search report

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4,532,143 A (THE J M SMUCKER COMPANY) 30/7/85	All
X	HU T041974 (KONCZ I) 29/6/87 Derwent Abstract 1987-208143	All
X	JP 01317361 A (SAITAMA YOHO KK) 22/12/1989 Derwent Abstract 1990-040641	All
X	JP 04148654-A (TAIYO KAGAKU CO LTD) 21/5/92 Derwent Abstract 1992-238087	All